ABSTRACT

The present invention provides systems and methods for determining the coordinates of a location element mounted on a medical probe. First and second signals are transmitted between the location element and a first and second reference transducers, which may be arranged in a reference array that can be attached to a patient's skin. A transit time difference between the first and second signals is determined, e.g., using a thresholding or correlation technique. A distance difference between a first distance extending from the location element to the first reference element and a second distance extending from the location element to the second reference element is then determined based on the transit time difference. An angle between the reference array and the location element can then be determined based on the determined distance difference and a known distance between the first and second reference transducers. The coordinates of the location element within a coordinate system are then determined based on the determined angle and the distance between the transducer array and the location element.